

A FLORISTIC SURVEY OF NATIONAL PARK SERVICE AREAS OF TIMUCUAN ECOLOGICAL AND HISTORIC PRESERVE (INCLUDING FORT CAROLINE NATIONAL MEMORIAL), DUVAL COUNTY, FLORIDA

Wendy B. Zomlefer

*Department of Plant Biology
University of Georgia
2502 Plant Sciences
Athens, Georgia 30602-7271, U.S.A.*

David E. Giannasi

*Department of Plant Biology
University of Georgia
2502 Plant Sciences
Athens, Georgia 30602-7271, U.S.A.*

Walter S. Judd

*Department of Botany
University of Florida
P.O. Box 118526
Gainesville, Florida 32611-8526, U.S.A.*

ABSTRACT

The portion of the Timucuan Ecological and Historic Preserve (including Fort Caroline National Memorial) administered by the National Park Service, U.S. Department of the Interior, comprises 3,723 ha (9,200 acres) in a series of disjointed land parcels in eastern Jacksonville, Duval County, Florida. A floristic survey was conducted to provide Park Service personnel with a vouchered checklist of vascular plant species, supplemented with salient information such as relative abundance, locality data, and community type. Three intensive collecting trips conducted in 2005 yielded 480 taxa (474 species plus 6 varieties) of vascular plants in 318 genera of 122 families. The five largest families are Asteraceae, Poaceae, Cyperaceae, Fabaceae, and Ericaceae. A map, descriptions, and photographs of the various plant communities are also provided.

RESUMEN

La porción de la Reserva Ecológica e Histórica de Timucuan, administrada por el Servicio de Parques Nacionales del Departamento del Interior, comprende 3,723 ha (9,200 acres) en un grupo de parcelas aisladas al este de Jacksonville, condado Duval, Florida. Se desarrolló un análisis florístico con el objetivo de proveer al personal del Servicio de Parques Nacionales, de una lista de las especies de plantas vasculares, suplementada con información sobre abundancia relativa, localidad y el tipo de comunidad circundante. Se realizaron tres giras de recolección intensiva durante 2005, produciendo un total de 480 taxa (474 especies y 6 variedades) de plantas vasculares, de 318 géneros y 122 familias. Las cinco familias más representadas son: Asteraceae, Poaceae, Cyperaceae, Fabaceae y Ericaceae. De igual forma se aportan mapas, descripciones y fotografías de las diferentes comunidades vegetales.

INTRODUCTION

Study Area

The Timucuan Ecological and Historic Preserve is located within the city limits of Jacksonville, Duval County, Florida (Fig. 1A), and is the largest cooperative park system in the United States, comprising federal, state, and city park lands, plus properties of private corporations, authorities, and over 300 private landowners (Anderson et al. 1996; Furbish et al. 1996; NPS 2007a). The large area, 46,000 acres (18,620 ha), encompasses the St. Johns River valley between the lower St. Johns and Nassau Rivers (Fig. 1B). These two rivers discharge directly into the Atlantic Ocean and form an extensive estuarine system dominated by salt marsh and coastal hammock habitat with marine to brackish open waters. The preserve itself is over 75 percent wetlands and open water (see Fig. 1B).

Dense housing developments (and other scattered pockets of urban growth) within preserve boundaries were established prior to formal land use planning for the area. Preserve upland areas are highly desirable for development due to their aesthetic value and proximity to open water. Industries, such as plant nurseries and construction companies, are concentrated west of the preserve, and rural residential development is spread out in lower density subdivisions in outlying tracts. Estuarine wetlands and waters within the preserve are claimed under sovereignty of the state of Florida up to the mean tide line, and the city of Jacksonville has




FIG. 1. Location and boundaries of Timucuan Ecological and Historic Preserve. **A.** Map of northeastern Florida, showing location of Timucuan Preserve (Fig. 1B) with dark gray shading. **B.** Map of eastern Jacksonville, Duval County, showing preserve area (shaded), bounded by St. Johns and Nassau Rivers. Park area includes waterways between the extensive salt marsh areas; the northern boundary (not shown) bisects the Nassau River along its length. Darker gray areas within the preserve = five survey parcels (NPS land): 1 = Thomas Creek; 2 = Cedar Point; 3 = Fort Caroline National Memorial/Theodore Roosevelt Area (see Fig. 2); 4 = Kingsley Plantation; 5 = Sohn Purchase. **BHI** = Black Hammock Island; **PP** = private property inholdings. **A:** modified by WBZ from DeLorme (1997); **B:** modified by WBZ from Furbish et al. (1996) and NPS (2004, 2005, 2007a).

jurisdiction over zoning and land use. The various administrative agencies and private citizens work through cooperative partnerships toward common acquisition and management goals (Anderson et al. 1996).

The areas within the preserve controlled by the National Park Service (NPS; U.S. Department of the Interior), comprise ca. 9,200 acres (3,723 ha; NPS 2004) of disjointed land parcels, including Fort Caroline National Memorial, discussed below (NPS 2007a). Over 60 percent of this NPS acreage is salt marsh (and submerged lands) bordering brackish waters. To obtain maximum plant diversity over such a broad area within three intense sampling trips, the survey team focused on five NPS land parcels (dark gray areas labeled “1” to “5” in Fig. 1B)—Thomas Creek, Cedar Point, Fort Caroline National Memorial/Theodore Roosevelt Area, Kingsley Plantation, and Sohn Purchase—that encompass a wide range of habitat types (including disturbed areas). Descriptive data on these habitats (discussed briefly below) are summarized in Table 1.

1. Thomas Creek Parcel.—This site, bordered along the east by I-95, is located ca. 3 miles (5 km) northeast of the Jacksonville International Airport. The gated property is accessed by easement through land owned by Castleton Beverage Corporation (a subsidiary of the Bacardi Corporation) at the end of Butch Bane Drive East. To the northeast, the Nassau River splits into Thomas Creek, and a smaller tributary, Seaton Creek, runs through the land more or less parallel to the interstate. Habitats comprise hardwood swamp surrounded by pinelands that have been extensively logged; other disturbed areas include a water-filled borrow pit and dike system (from interstate construction). Trespassing poachers, who access the remote property along the interstate border, are a problem for NPS personnel. As of this writing, the future of the easement property, now for sale, is unknown. A Revolutionary War battle may have been fought within property boundaries: the Battle of Thomas Creek (17 May 1777), the final engagement in the second attempt by American forces to invade the British province of East Florida (Boatner 1973). However, the exact location of the battle has not been verified (R. Bryant, pers. comm.).

2. Cedar Point.—Cedar Point is at the end of south Cedar Point Road (ca. 5 mi [8 km] east of New Berlin Road) and comprises extensive salt marsh surrounded by upland maritime hammock and some former pine plantations. This property (and the Sohn Purchase, 5. below) is on the popular Black Hammock Island in northeastern Jacksonville, which is bordered by the Nassau River to the north and extensive marshes of the St. Johns River, to the south. (Cedar Point occupies the southwestern tip with wetlands of the St. Johns and Ft. George Rivers.) Black Hammock Island was only sparsely populated until the 1980's when infrastructure for development (paved roads, mail delivery, garbage service) became widely available; the opening of the Dames Point Bridge (over the St. Johns River) in 1989 further stimulated the population boom. The general area is now well known for panoramic views of marshlands and waterways. Cedar Point is a former fish camp (with cleared areas for parking and a boat ramp). Plans by NPS to construct a visitors' center there (with extensive hiking trails) may be delayed due to recent archeological evidence indicating some historical significance to this site (R. Bryant, pers. comm.).

3. Fort Caroline National Memorial/Theodore Roosevelt Area.—This property comprises the Fort Caroline National Memorial/Ribault Monument, NPS headquarters/museum, and the Theodore Roosevelt Area (see detailed map, Fig. 2). These combined areas, a significant inholding among very expensive homes and waterfront property, have over 4 mi [6.4 km] of publicly accessible trails through extensive hammock, swamp, and salt marsh. Fort Caroline National Memorial (138 acres [56 ha]; including the fort exhibit, visitors' center, park maintenance buildings, parking area, and boat dock) is located on the north side of Fort Caroline Road (just north of the intersection with Monument Road) and borders the southern shore of the St. Johns River; Ribault Monument is in a small disjunct area (8 acres [3 ha]) about 0.7 mi (1.1 km) further east along the river (see **Brief History** of these monuments below.) Park headquarters is located about a mile to the south along Mount Pleasant Road, adjacent to the Theodore Roosevelt Area to the north and east. The latter ca. 578 acres (234 ha) of ecologically significant, valuable real estate were bequeathed to the Nature Conservancy by this property's last private owner, Willie Browne (1889–1970), in tribute to President Theodore Roosevelt and his conservation efforts. The NPS acquired the land in 1990.

4. Kingsley Plantation.—The plantation (including NPS offices and parking areas) is located on the northern point of Fort George Island, along the Fort George River. Most of the surrounding habitat (primarily

TABLE 1. Year of acquisition, size, location, significance, access, and habitats of the five survey sites of Timucuan Ecological and Historic Preserve administered by the National Park Service, Jacksonville, Florida (Fig. 1B). Data from Anderson et al. (1996), Bennett (1976), NPS (2004), NPS (2007a), and R. Bryant (pers. comm.). Habitat types: **AQ** = aquatic habitat (standing freshwater and surrounding margin); **DA** = disturbed area; **DU** = dunes/open beach; **MH** = maritime hammock; **PF** = pine flatwoods; **SA** = sandhill/scrub community; **SH** = shell midden; **SM** = salt marsh; **SW** = swamp.

Parcel [Year Acquired by NPS]	Area ha (acres)	Location	Historical and/or Ecological Importance	Public Access	Habitat Types
1. Thomas Creek [1995]	243 (600)	Dead end w Butch Bane Dr. East, gated entrance through easement property; bordered by Thomas Creek and I-95	Various wetland communities; possible site of Revolutionary War "Battle of Thomas Creek"	No	AQ, DA, PF, SW
2. Cedar Point [1996]	162 (400)	Black Hammock Island: 9023 Cedar Point Rd.; n of St. Johns and Ft. George Rivers	Riverfront property, encroaching development; significant habitats including extensive salt marsh; possible archeological significance	Yes	DA, MH, SM
3. Fort Caroline National Memorial [1950] & Ribault Monument [1958 at its present location]/Theodore Roosevelt Area [1990]	293 (724)	12713 Fort Caroline Rd./13165 Mt. Pleasant Rd. (park headquarters; Roosevelt Area w of headquarters and s of fort); see Fig. 2	Valuable real estate, encroaching development; national memorial sites; significant habitats including wetlands	Yes	AQ, DA, DU, MH, SA, SH, SM, SW
4. Kingsley Plantation [1991]	32 (80)	Nw Ft. George Island; along Ft. George River	Valuable real estate; early 19th century plantation, including planter's residence, slave quarters	Yes	DA, DU, MH, SM
5. Sohn Purchase [2001]	85 (211)	Black Hammock Island: gated entrance w of 13501 Saw Pit Rd.; s of Nassau River, w of Pumpkin Creek	Valuable real estate, encroaching development; significant habitats including wetlands	No	AQ, DA, SA, SW

hammock) is disturbed. During Florida's plantation period (1763–1865), the isolated Fort George Island was owned by a series of planters, including Zephaniah Kingsley and his wife, Anna (a former slave from Senegal), who lived there from 1814 to 1837 (Schafer 1997; Stowell and Tilford 1998; Mallard 2007). The primary cash crop was sea island cotton (*Gossypium barbadense*), grown for the exceptionally long fibers spun into fine strong thread. The existing compound comprises the restored planter's residence (ca. 1798) with heritage gardens, as well as the nearby ruins of the slaves' quarters (arranged in semicircle), constructed of tabby (a mixture of oyster shells, sand, and water). One cabin has been restored to its original appearance for the interpretive display.

5. Sohn Purchase.—The gated property, named after its last private owner, is located along the west side Saw Pit Road, ca. 1.5 mi (2.4 km) north of Cedar Point Road (see 2. Cedar Point above) and is in west-central Black Hammock Island, a rural portion undergoing development. The area was acquired by NPS in 2001 (R. Bryant, pers. comm.). The land is bordered to the west by Pumpkin Hill Creek, a southern branch of Nassau River, which feeds the swamp and wetlands (marsh and open water areas) of the northern, western, and southern parts of the property. Scrubby sandhill (last burned in 1993), densely covering the eastern and central portions, intergrades with the various wetland habitats. The extreme southern end of the property was burned in 1998.

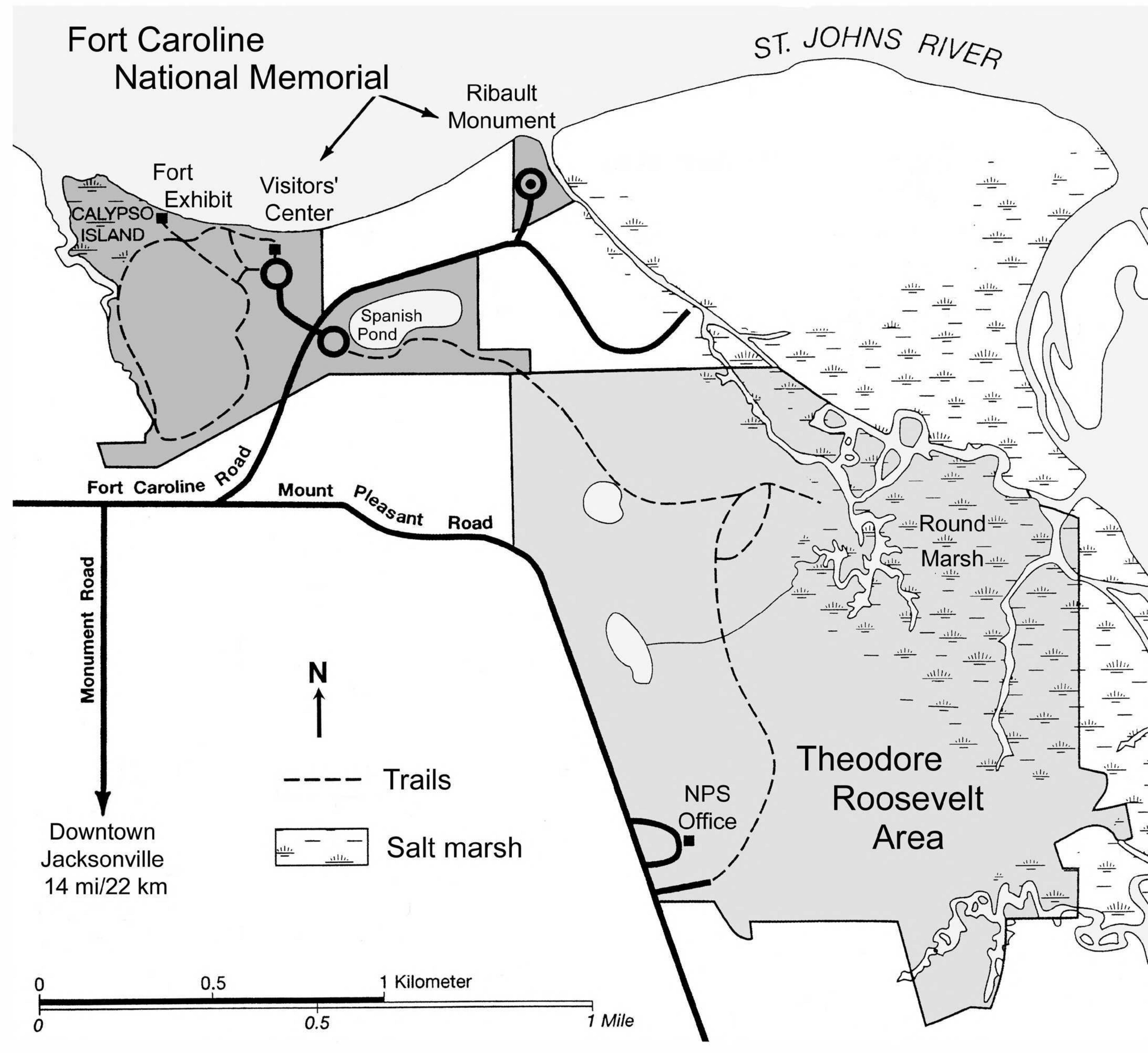


FIG. 2. Detailed map of Fort Caroline National Memorial and Theodore Roosevelt Area (survey area 3 in Fig. 1B). Modified by WBZ from NPS (2007a).

Brief History of Fort Caroline National Memorial and Timucuan Ecological and Historic Preserve

In February 1562, an expedition lead by French naval officer Jean Ribault landed on the mouth of the River May (now St. Johns River) and was welcomed by Chief Saturiwas, the head of a Timucua-speaking tribe of Native Americans. Two years later, René Goulaine de Laudonnière founded the colony of la Caroline (named for reigning French King Charles IX) on St. Johns Bluff (Bennett 1976, 2001). The Timucuan Indians helped the settlers build the triangular Fort Caroline (Fort de la Caroline). The colony struggled to survive, and Ribault returned from Europe to take command of the settlement in August 1565. A month later, Don Pedro Menéndez de Avilés, governor of Florida for Spain, attacked Fort Caroline. As "heretics" (Huguenots or Protestants), the French were a threat to Catholic Spanish colonization in Florida. Most of the colony and members of Ribault's fleet were slaughtered (245 French soldiers; see Zomlefer et al. 2004). The massacre ended attempts by the French to colonize Florida. The Spanish abandoned the fort in 1569.

Fort Caroline National Memorial (Fig. 2) was established along the lower St. Johns River in 1950 to commemorate sixteenth century French efforts to establish a permanent colony in Florida. The memorial is listed on the National Register of Historic Places under the National Historic Preservation Act of 1966 (NPS 2007b). The park features a visitors' center to complement a somewhat scaled-down reconstruction

of the fort (ca. 200 × 200 × 300 ft [61 × 61 × 91 m]) based on a sketch by Jacques le Moyne, the colony's mapmaker. Ribault Monument, an obelisk situated atop St. Johns Bluff, commemorates Jean Ribault's landing near the mouth of the St. Johns River. The exact site of Fort Caroline (and the settlement) is unknown and was likely destroyed when the river channel was deepened and widened in the 1880's (Anderson et al. 1996; NPS 2007a).

Fort Caroline National Memorial is specifically designated as a unit within the Timucuan Ecological and Historic Preserve, authorized by Congress in 1988 through Public Law 100-249 (Furbish et al. 1996). The preserve was created to protect and interpret the ecological and historical resources of the area, which include one of the few remaining unspoiled coastal wetlands along the Atlantic. The name honors the extirpated native American Timucua tribes, who made contact with the first European arrivals to the area: "Timucua" actually refers to several culturally diverse tribes, sharing the same language, who inhabited northern Florida and southeastern Georgia (Hann 1996). European diseases devastated the population, and by 1700, less than 550 of these native Americans survived; today, no known indigenous people are Timucua.

MATERIALS AND METHODS

The first authors, Zomlefer and Giannasi, led three intensive field trips in 2005 (21–24 April, 28 June–1 July, 29 September–2 October; Giannasi & Zomlefer 1184–1573, 1576–1738) to collect vascular plant specimen vouchers in duplicate using standard field and herbarium techniques (under NPS collecting permit # TIMU-2003-SCI-0001) with assistance of coauthor Judd and personnel listed in the acknowledgments. Plant associations were also assessed. The survey focused on five main land parcels administered by NPS (Fig. 1B; Table 1). The floras of Wunderlin and Hansen (2000, 2003) were primary sources for plant identification, supplemented by Godfrey and Wooten (1979, 1981) and Godfrey (1988). The majority of plants were identified by WBZ and DEG; Stephen Lee Echols identified most grasses and sedges; and coauthor WSJ confirmed other problematic determinations. A complete set of vouchers is deposited at GA. A duplicate set is at the Timucuan Ecological and Historical Preserve Museum (see NPS 2007a); that collection is hereafter designated "TIMU," a Park Service acronym not registered in *Index Herbariorum* (Holmgren & Holmgren 2007).

RESULTS AND DISCUSSION

Floristics

The 554 numbered collections comprise 480 taxa (474 species plus 6 varieties) in four major vascular plant groups (see ANNOTATED CHECKLIST OF SPECIES below): lycophytes (1 sp.), monilophytes ("ferns and allies;" 10 spp.), gymnosperms (7 spp.), and angiosperms (256 spp. + 6 vars.). Included in the list are 26 species planted around park headquarter/visitor buildings (Fort Caroline National Memorial, Theodore Roosevelt Area, and St. George Island; indicated as "CULT"). The largest families are: Asteraceae (62 spp. + 1 var.), Poaceae (40 spp. + 3 vars.), Cyperaceae (26 spp.), Fabaceae (21 spp. + 1 var.), Ericaceae (16 spp.), Euphorbiaceae (11 spp.), Rubiaceae (11 spp.), Fagaceae (10 spp.), Hypericaceae (10 spp.), Juncaceae (10 spp.), Onagraceae (10 spp.), Lamiaceae (9 spp.), and Plantaginaceae (9 spp.). With completion of this survey, we have vouchered 56 new county records (54 species and two varieties) for Duval County, Florida, according to Wunderlin and Hansen (2007).

No state/federally listed endangered plants (Duever 1996; Coile & Garland 2003; U.S. Fish and Wildlife Service 2007) and no Florida endemics were found; however, *Liatris tenuifolia* var. *quadriflora*, cited in Wunderlin and Hansen (2003) as endemic to Florida, has been recently vouchered from Cumberland Island, Georgia (Zomlefer et al., in prep.). Three state listed threatened species were found: *Drosera intermedia* (water sundew), *Opuntia stricta* (erect pricklypear), and *Sarracenia minor* (hooded pitcherplant); in addition, *Osmunda cinnamomea* (cinnamon fern), *Osmunda regalis* var. *spectabilis* (royal fern), and *Rhododendron canescens* (mountain azalea) are state listed commercially exploited plants (Coile & Garland 2003).

Excluding the 21 cultivated exotics, the remaining 61 introduced species represent 13.5% of the total. Eleven species (including three cultivated plants) are listed as invasive exotics by Florida Exotic Pest Plant

Council (FLEPPC 2007). Nine of these are ranked as Category I (invasive exotics altering native plant communities by displacing native species, changing community structures/ecological functions, or hybridizing with natives): *Asparagus aethiopicus*, *Cinnamomum camphora*, *Dioscorea bulbifera*, *Eichhornia crassipes*, *Lantana camara*, *Lonicera japonica*, *Lygodium japonicum*, *Macfadyena unguis-cati*, and *Sapium sebiferum*. Two species, *Alternanthera philoxeroides* and *Wisteria sinensis*, are in Category II (invasive exotics increasing in abundance/frequency but not yet altered Florida plant communities to the extent shown by Category I plants). *Asparagus aethiopicus* (Sprenger's asparagus-fern) and *Lonicera japonica* (Japanese honeysuckle) are planted at the NPS Park offices (Kingsley Plantation, Ft. George Island) and apparently are restricted to their flower bed plots; however, at the same site *Wisteria sinensis* (Chinese wisteria) and *Macfadyena unguis-cati* (catclawvine) are naturalized and spreading. *Lantana camara* (lantana), represented by a few plants cultivated with *L. depressa* and *L. montevidensis* near a boat dock (just east of reconstructed Fort Caroline), has some potential to spread into the disturbed areas surrounding the fort. *Lygodium japonicum* (Japanese climbing fern) is locally common along the path through the maritime hammock surrounding the fort and should be removed before invading further. *Dioscorea bulbifera* (air-potato) and *Eichhornia crassipes* (common water-hyacinth), serious invasives, are common and well established around Spanish Pond. The Thomas Creek Parcel has three invasive species in aquatic habitats where propagules are likely dispersed by water runoff from I-95: *Alternanthera philoxeroides* (alligatorweed; infrequent; dike area), *Cinnamomum camphora* (camphortree; infrequent; swamp), and *Sapium sebiferum* (popcorn tree; locally common; dike area and swamp). Of these, *Sapium sebiferum* is the most common in this land parcel: the many seedlings, established along the margins of these aquatic habitats and in standing water, have potential to rapidly displace native species, especially in the hardwood swamp.

A significant native species is in danger of extinction in the preserve due to a recent invasion of an exotic insect. In late June 2005 coauthors Zomlefer and Giannasi noted dying redbay trees (*Persea borbonia*), likely infected with redbay wilt, in the maritime forests of Cedar Point after park service personnel had reported similar occurrences at Kingsley Plantation. The presence of this fungal disease carrier, redbay ambrosia beetle (*Xyleborus glabratus*), was confirmed at the preserve in October of that year (Mayfield & Thomas 2006). Redbay wilt has since spread widely along the coast (R. Bryant, pers. comm.; Zomlefer et al., in prep.). *Persea borbonia* is a dominant understory component, and large-scale redbay mortality will greatly alter the composition of maritime forests along these coastlines.

Plant Communities

Nine community types of the survey area are summarized below and several are depicted in Figure 3: dune; salt marsh; shell midden; maritime hammock; sandhill community; aquatic habitat (standing freshwater and surrounding margin); swamp; pine flatwoods; and disturbed areas. Table 1 includes a listing of habitat types in each of the five survey sites. Habitats often intergrade within a site. These general categories are based upon our field observations and classifications of similar areas by Laessle and Monk (1961), Stalter and Dial (1984), Myers and Ewel (1990), FNAI (1990), Easley and Judd (1993), and Zomlefer et al. (2004).

Dunes/Open Beach.—The open beach comprises exposed sandy beach up to the high tide line, and foredune is the zone bordering the open beach, often sparsely vegetated with salt tolerant, pioneer species (Johnson & Barbour 1990; Zomlefer et al. 2004). Limited beach-like plant communities occur on narrow sandy strips (ca. 15 ft [4.6 m] wide) along the river beaches on the northern sides of Kingsley Plantation (St. George River) and the Fort Caroline exhibit (St. Johns River). Typical beach species found at these locations include: *Batis maritima*, *Borrichia frutescens*, *Cenchrus spinifex*, *Hydrocotyle bonariensis*, *Ipomoea alba*, *Oenothera laciniata*, *Physalis walteri*, *Sarcococca perennans*, *Sesuvium portulacastrum*, and *Strophostyles helvola*.

Salt Marsh.—Salt marshes in Florida are coastal communities of salt-tolerant plants occupying intertidal zones at least occasionally inundated with salt water, characterized by dense stands of *Spartina alterniflora* (saltmarsh cordgrass) and/or *Juncus roemerianus* (black rush; Montague & Wiegert 1990; Easley & Judd 1993; Zomlefer et al. 2004). Extensive expanses of salt marsh comprise Cedar Point, as well as the north-eastern portion of the Theodore Roosevelt Area (Round Marsh, Fig. 3D); smaller areas are located along the western side of Fort Caroline (Calypso Island) and western edge of Kingsley Plantation (Steinway-Rodkin




FIG. 3. Examples of plant communities of Timucuan Ecological and Historic Preserve. A. Scrubby sandhill (Sohn Property, Sep 2005)—dense overstory: *Quercus geminata* with *Ilex vomitoria*, *Lyonia lucida*, and *Serenoa repens*. B. Longleaf pine-turkey oak sandhill (NPS headquarters, Theodore Roosevelt

& Montague 2003). Besides saltmarsh cordgrass and black rush, common salt-tolerant plants within these marshes include: *Atriplex cristata*, *Batis maritima*, *Chenopodium album*, *Cynanchum angustifolium*, *Distichlis spicata*, *Limonium carolinianum*, *Sarcocornia perennis*, *Sesuvium portulacastrum*, and *Suaeda linearis*. These salt marshes are bordered by woody plants such as: *Baccharis halimifolia*, *Borrichia frutescens*, *Ilex vomitoria*, *Iva frutescens*, *Juniperus virginiana*, *Lycium carolinianum*, *Myrica cerifera*, *Opuntia stricta*, and *Sabal palmetto*.

Shell Midden (Shell Mound).—This coastal habitat is formed from the activities of native Americans who created elevated mounds of mollusk shell fragments that become mixed with organic matter over time (Fig. 3F). Water drains rapidly through the calcareous substrate and supports a distinctive set of indicator species; a closed hardwood canopy eventually develops (FNAI 1990). Well-developed shell midden habitat occurs around the salt marshes of the Theodore Roosevelt Area (Round Marsh, Fig. 3E), mainly as a sparse shrubby community intergrading with maritime hammock. The scrubby overstory species include: *Forestiera segregata*, *Ilex vomitoria*, *Iva frutescens*, *Juniperus virginiana*, *Myrica cerifera*, *Quercus geminata*, and *Sabal palmetto*—with tangled vines of *Cynanchum scoparium* and *Smilax auriculata*. *Borrichia frutescens*, *Chiococca alba*, *Eustachys petraea*, *Iresine rhizomatosa*, *Opuntia pusilla*, and *Psychotria nervosa* are common in the understory.

Maritime Hammock (Coastal Hammock; Maritime Forest).—This habitat, the terminal stage of succession in coastal areas, is a band of “hardwood” forest just inland of the coastal strand on old, stabilized dunes; the generally mesic conditions are maintained by the dense canopy (Laessle & Monk 1961; Stalter & Dial 1984; Easley & Judd 1993; Zomlefer et al. 2004). Well established maritime hammock borders the salt marshes of Fort Caroline National Memorial (Fig. 3C)/Theodore Roosevelt Area and Cedar Point. The branches of dominant species *Quercus virginiana* and *Q. geminata* are characteristically covered with epiphytes *Pleopeltis polypodioides*, *Tillandsia recurvata*, and *Tillandsia usneoides*. *Juniperus virginiana*, *Persea borbonia*, *Prunus serotina*, and *Sabal palmetto* are principal understory trees; other tree species are common at certain sites: *Asimina parviflora* and *Sapindus saponaria* at Theodore Roosevelt Area, and *Carya glabra* around Cedar Point. *Callicarpa americana*, *Ilex vomitoria*, *Myrica cerifera*, *Serenoa repens*, and *Vaccinium* spp. are common understory shrubs (or shrubby trees); *Hamamelis virginiana* is also ubiquitous around Fort Caroline. In the Roosevelt Area, *Psychotria nervosa* (a shrub in tropical areas) is a common understory plant but usually much less than 2 ft (0.6 m) tall. Woody vines are prevalent (i.e., *Parthenocissus quinquefolia*, *Smilax* spp., *Vitis aestivalis*, *Vitis rotundifolia*); common herbaceous understory plants include: *Bidens bipinnata*, *Elephantopus nudatus*, *Galactia elliottii*, *Galium hispidulum*, *Melanthera nivea*, *Oplismenus hirtellus*, *Ruellia caroliniensis*, *Sanicula canadensis*, *Smallanthus uvedalia*, *Sporobolus indicus*, and *Vernonia gigantea*.

Sandhill Community.—Sandhill is characterized by rolling hills of deep, relatively sterile sands inhabited usually by widely spaced oaks and pines with a ground cover of characteristic herbs (and some shrubs). Fire is a dominant factor in maintaining this community (FNAI 1990). Sandhill-type associations occur on two survey sites. The eastern and central portions of the Sohn Purchase is a large area of “scrubby sandhill” (Fig. 3A), comprising a relatively dense woody canopy—dominated by *Quercus geminata* with some *Q. chapmanni*, *Pinus elliottii*, and *P. taeda*—and various shrubs, including: *Gaylussacia* spp., *Ilex vomitoria*, *Lyonia ferruginea*, *L. lucida*, *Myrica cerifera*, *Serenoa repens*, and *Vaccinium myrsinites*. The sandhill scrub intergrades gradually with more mesic habitats (swamp to the south; marshland to the northwest). A restricted area (ca. 3.7 acres [1.5 ha]), enclosed by the circular driveway of NPS headquarters (Mount Pleasant Road, Fig. 2), is typical longleaf pine–turkey oak sandhill (*Pinus palustris*–*Quercus laevis*) also dominated by *Q. geminata* (Fig. 3B);

Area, Oct 2005)—overstory: scattered *Pinus palustris* and *Quercus falcata* (background); understory: *Serenoa repens* (right front) and scattered plants of *Carphephorus corymbosus* (center). C. Maritime hammock (Fort Caroline National Memorial, Oct 2005)—overstory: *Quercus virginiana* with *Vitis rotundifolia* vines; understory: *Hamamelis virginiana* (center), *Sanicula canadensis* (left foreground), and *Serenoa repens* (foreground). D. Salt marsh (Round Marsh, Theodore Roosevelt Area, Oct 2005)—tidal creek bounded by *Spartina alterniflora* (bright green) and *Juncus roemerianus* (dark grayish green); bordering forest (background): *Juniperus virginiana*, *Quercus virginiana*, and *Sabal palmetto*. E. Shell midden (Round Marsh, Theodore Roosevelt Area, Oct 2005)—overstory: *Juniperus virginiana* (left foreground) and *Forestiera segregata* (background) with *Smilax auriculata* vines (right front); ground cover: *Eustachys petraea* (open area). F. Shell midden substrate (same location as E.)—mollusk shell fragments mixed with organic matter. G. Swamp (Thomas Creek Parcel, Apr 2005)—overstory trees with expanding leaves (background): *Acer rubrum*, *Liquidambar styraciflua*, and *Nyssa sylvatica* var. *biflora*; understory: *Iris hexagona* (center), *Rubus argutus* (left front), and *Thelypteris kunthii* (right front). Photo credit: W.B. Zomlefer.

the sparser shrub layer has most of the species present at the Sohn Purchase, with the notable addition of *Ceratiola ericoides*. Common understory sandhill plants of these two sites include *Andropogon* spp., *Aristida spiciformis*, *Baldina angustifolia*, *Berlandiera pumila*, *Callisia graminea*, *Carphephorus odoratissimus*, *Crotalaria rotundifolia*, *Eragrostis elliottii*, *Eryngium aromaticum*, *Gratiola hispida*, *Lechea torreyi*, *Liatris tenuifolia*, *Licania michauxii*, *Palafoxia integrifolia*, *Pityopsis graminifolia*, *Pteridium aquilinum*, *Seymeria pectinata*, *Smilax auriculata*, *Stillingia sylvatica*, and *Styloisma patens*.

Aquatic Habitats.—This general habitat category designates areas of open freshwater, including the surrounding margin of often woody vegetation (FNAI 1990). The survey included several ponds in the Fort Caroline National Memorial/Theodore Roosevelt Area (including Spanish Pond; 4 acres [1.6 ha]); expanses of standing water of marshlands in the Sohn Purchase; and the water-filled borrow pit and dikes of Cedar Creek as well as higher waters bordering the swamp there. Floating aquatic species include: *Eichhornia crassipes*, *Landoltia punctata*, *Lemna aequinoctialis*, *Limnobium spongia*, *Nymphaea odorata*, *Sagittaria filiformis*, and *Salvinia minima*; common emergent wetland plants are: *Cladium jamaicense*, *Eleocharis flavescens*, *Gratiola ramosa*, *Hypericum mutilum*, *Juncus effusus*, *Ludwigia* spp., *Panicum hemitomon*, *P. verrucosum*, *Pluchea rosea*, *Polygonum* spp., *Pontederia cordata*, *Rhynchospora fascicularis*, *Sagittaria graminea*, *S. lancifolia*, *Setaria parviflora*, and *Spartina bakeri*. *Cephalanthus occidentalis*, *Diospyros virginiana*, *Ilex glabra*, *Lyonia fruitcosa*, *Pinus serotina*, and *Salix caroliniana* are often components of the scrubby border of these wetlands.

Swamp (Lowland Hardwood Forest).—This habitat occurs in low-lying, periodically flooded areas (often bordering stream banks); the soil is a mixture of clay and organic matter (Ewel 1990; FNAI 1990). Swamp forest is characterized as a closed-canopy of tall deciduous hardwoods with dense shrubby understory. Ferns and herbs also occur in more open areas. The southeastern portion of Thomas Creek has substantial swamp (Fig. 3G) that intergrades with flatwoods; the mesic hardwoods of the southern Sohn property gradually transitions into scrubby sandhill. Mixed swamp–maritime hammock vegetation also surrounds Spanish Pond in the Fort Caroline National Memorial/Theodore Roosevelt Area. The following canopy trees are typical for Thomas Creek (and many also occur at the other swamp sites): *Acer rubrum*, *Fraxinus caroliniana*, *Liquidambar styraciflua*, *Magnolia virginiana*, *Nyssa sylvatica* var. *biflora*, *Persea palustris*, *Platanus occidentalis*, *Quercus laurifolia*, *Q. nigra*, *Q. virginiana*, and *Ulmus americana*. Woody understory species include: *Carpinus caroliniana*, *Ilex cassine*, *Myrica cerifera*, *Smilax laurifolia*, *Rubus argutus*, and *Toxicodendron radicans*. Examples of herbaceous plants that flourish under open areas of the canopy (often in standing water) include: *Boehmeria cylindrica*, *Carex vulpinoidea*, *Chasmanthium laxum*, *Iris hexagona*, *Juncus effusus*, *Osmunda cinnamomea*, *Paspalum urvillei*, *Pontederia cordata*, *Rhynchospora* spp., *Saururus cernuus*, *Thelypteris kunthii*, and *Woodwardia areolata*.

Pine Flatwoods (Mesic Flatwoods; Pine Savannah).—These relatively flat areas are characterized by poorly drained terrain composed of up to 3 ft (ca. 1 m) of sand overlying organic/clayey hardpan that impedes water percolation, so that this habitat is frequently inundated. The overstory is an open canopy forest of widely spaced pines with little understory and a dense ground cover of shrubs and herbaceous plants (Abrahamson & Hartnett 1990; FNAI 1990). Like sandhill, pine flatwoods are also maintained by fire. Disturbed flatwood habitat is located in the central portion of the Thomas Creek parcel. This logged area, once a pine plantation, grades into the lower lying hardwood swamp to the south. *Pinus taeda* (loblolly pine) and *P. elliottii* (slash pine) are the dominant overstory species. Shrubs, scattered throughout the wetland and also along its margins, include: *Bejaria racemosa*, *Cyrilla racemiflora* (not vouchered), *Ilex* spp., *Lyonia lucida*, *Lyonia ligustrina* var. *foliosiflora* (not vouchered), *Lyonia mariana*, *Myrica cerifera*, *Quercus elliottii*, *Q. minima*, *Q. myrtifolia*, *Rhus copallina*, *Serenoa repens*, and *Vaccinium corymbosum*. Shrubby and herbaceous species of *Hypericum* are common, e.g., *H. brachyphyllum*, *H. fasciculatum*, *H. gentianoides*, *H. hypericoides*, *H. mutilum*, and *H. tetrapetalum*. The diverse herbaceous flora (many aquatic species in depressions) also includes: *Andropogon* spp., *Baldina uniflora*, *Bidens mitis*, *Bigelowia nudata*, *Carphephorus odoratissimus*, *Eleocharis* spp., *Eriocaulon decangulare*, *Euthamia caroliniana*, *Fuirena breviseta*, *Helianthus angustifolius*, *Juncus effusus*, *Lachnanthes caroliana*, *Lachnocaulon anceps*, *Liatris* spp., *Linum medium*, *Ludwigia* spp., *Polygala lutea*, *P. nana*, *Rhexia alifanus*, *Rhynchospora fascicularis*, *Sabatia brevifolia*, *Sarracenia minor*, *Scleria ciliata*, *Sorghastrum secundum*, *Typha latifolia*, *Utricularia subulata*, and *Xyris* spp.

Disturbed Areas (Ruderal Community).—Disturbed habitats have developed around public-access areas of Cedar Point, Kingsley Plantation, and especially within and around the reconstructed Fort Caroline and visitors' center and along the south side of Ft. Caroline Road (bordering Spanish Pond). Common weedy plants occurring in these areas include: *Acalypha graciliens*, *Ambrosia artemisiifolia*, *Boerhavia diffusa*, *Cerastium glomeratum*, *Chamaesyce* spp., *Dactyloctenium aegyptium*, *Desmodium incanum*, *Digitaria ciliaris*, *Diodia teres*, *Eleusine indica*, *Gamochaeta antillana*, *Lepidium virginicum*, *Paspalum notatum*, *Phyla nodiflora*, *Phyllanthus* spp., *Plantago virginica*, *Rubus trivialis*, *Sambucus nigra*, *Sida rhombifolia*, *Sonchus asper*, *Stellaria media*, and *Triodanis perfoliata*.

ANNOTATED CHECKLIST OF VASCULAR PLANT TAXA

A list of 474 vascular plant species representing 318 genera in 122 families is here compiled from Giannasi & Zomlefer specimens (collection numbers in *italic*) in alphabetical order by family within four major groups (lycophytes, monilophytes ["ferns and allies"], gymnosperms, and angiosperms). Genera, species, and infraspecific taxa are alphabetical within each family. Scientific nomenclature and common names follow Wunderlin and Hansen (2003); exceptions are vernacular names of a few horticultural plants (not included in their flora) that conform to Huxley (1992). Family circumscriptions for lycophytes and monilophytes follow Smith et al. (2006); for gymnosperms, FNA (1993); and for angiosperms, APG (2003).

Underlined taxa = new vouchered Duval County records according to on-line species list by Wunderlin and Hansen (2007); * = exotic (Wunderlin & Hansen 2003); invasive exotics (FLEPPC 2007): [CAT I] = Category I; [CAT II] = Category II; CULT = cultivated (i.e., planted on park grounds); [UNI] = unicate specimen (i.e., at GA, no duplicate at TIMU). Locality data: (1) = Thomas Creek Parcel; (2) = Cedar Point; (3) = Fort Caroline National Memorial/Theodore Roosevelt Area; (4) = Kingsley Plantation (Ft. George Island); (5) = Sohn Purchase. Habitat data: AQ = aquatic habitat (standing freshwater and surrounding margin); DA = disturbed area; DU = dunes/open beach; MH = maritime hammock; PF = pine flatwoods; SA = sandhill community; SH = shell midden; SM = salt marsh; SW = swamp. Relative abundance: c = common (generally abundant throughout a particular habitat; species easily found); o = occasional (locally common and/or several individuals distributed within a habitat; species not too difficult to locate); i = infrequent (sporadic occurrence of a small number of individuals; species relatively scarce and not easily found); r = rare (very few individuals encountered).

LYCOPHYTES

Lycopodiaceae

Lycopodiella alopecuroides (L.) Cranfill, Foxtail club-moss, (5), SA/SW, i, 1458

MONILOPHYTES ("FERNS and allies")

Blechnaceae

Woodwardia areolata (L.) T. Moore, Netted chain fern, (3), AQ/MH/SW, c, 1295

Woodwardia virginica (L.) Sm., Virginia chain fern, (1), AQ/DA, c, 1369

Dennstaedtiaceae

Pteridium aquilinum (L.) Kuhn var. *pseudocaudatum* (Clute) Clute ex A. Heller, Bracken fern, (5), SA, c, 1184

Lomariopsidaceae (Dryopteridaceae)

**Nephrolepis exaltata* (L.) Schott, Wild Boston fern, (3), DA, o, 1274

Lygodiaceae (Schizaeaceae)

**Lygodium japonicum* (Thunb.) Sw., Japanese climbing fern, (3), [CAT I], DA/MH, c, 1484

Osmundaceae

Osmunda cinnamomea L., Cinnamon fern, (3)/(5), AQ/MH/SW, c-o, 1296, 1621

Osmunda regalis L. var. *spectabilis* (Willd.) A. Gray, Royal fern, (3), MH, c, 1719

Polypodiaceae

Pleopeltis polypodioides (L.) E.G. Andrews & Windham var. *michauiiana* (Weath.) E.G. Andrews & Windham, Resurrection fern, (3), MH, c, 1473

Salviniaceae

**Salvinia minima* Baker, Water spangles, (1), AQ/DA, i, 1710 [UNI]

Thelypteridaceae

Thelypteris kunthii (Desv.) S.V. Morton, Widespread maiden fern, (1), SW, c, 1490

GYMNOSPERMS

Cupressaceae

Juniperus virginiana L., Red cedar, (1)/(3), AQ/DA/MH, c-o, 1233, 1364

Cycadaceae

**Cycas revoluta* Thunb., Sago palm, (3), CULT, 1562

Pinaceae

Pinus elliottii Engelm., Slash pine, (5), SA, O, 1640
Pinus palustris Mill., Longleaf pine, (3), SA, C, 1303
Pinus serotina Michx., Pond pine, (1), AQ/DA, I, 1362
Pinus taeda L., Loblolly pine, (5), SA/SW, O, 1641

Podocarpaceae

**Podocarpus macrophyllus* (Thunb.) D. Don, Japanese podo-
berry, (3), CULT, 1572

ANGIOSPERMS**Acanthaceae**

Elytraria caroliniensis (J.F. Gmel.) Pers. var. *caroliniensis*, Carolina
scalystem, (1), SW, O, 1497
 **Justicia brandegeana* Wassh. & L.B. Sm., Shrimplplant, (3), DA,
r, 1268 [Escaped from cultivation and persisting; may be
naturalized.]
Ruellia caroliniensis (J.F. Gmel.) Steud., Carolina wild petunia,
(3), MH, C, 1386
 **Odontonema cuspidatum* (Nees) Kuntze, Firespike, (3), CULT,
1725

Adoxaceae

Sambucus nigra L. subsp. *canadensis* (L.) R. Bolli, American
elder, (3), DA, O, 1280
 **Viburnum odoratissimum* Ker-Gawl., Sweet viburnum, (3),
CULT, 1270, 1722

Agavaceae

Yucca aloifolia L., Spanish bayonet, (3), CULT, 1592

Aizoaceae

Sesuvium portulacastrum (L.) L., Shoreline seapurslane, (4),
DU/SM, O, 1371
 **Tetragonia tetragonoides* (Pall.) Kuntze, New Zealand spinach,
(4), DU/SM, C, 1529

Alismataceae

Sagittaria filiformis J.G. Sm., Threadleaf arrowhead, (5), AQ, I, 1652
Sagittaria graminea Michx. var. *graminea*, Grassy arrowhead,
(5), AQ, O, 1205
Sagittaria lancifolia L. var. *lancifolia*, Bulltongue arrowhead,
(1), AQ/DA, O, 1520

Alliaceae

Allium canadense L. var. *canadense*, Meadow garlic, (1), DA/SW,
r, 1313
Nothoscordum bivalve (L.) Britton, Crowpoison, (4), DA, r, 1376
[UNI]

Altingiaceae

Liquidambar styraciflua L., Sweetgum, (1), SW, C, 1492

Amaranthaceae

**Alternantheraphiloxeroides* (Mart.) Griseb., Alligatorweed, (1),
[CAT II], AQ/DA, I, 1716 [UNI]
Atriplex cristata Humb. & Bonpl. ex Willd., Crested saltbush,
(2), SM, O, 1538
 **Chenopodium album* L., Lamb's-quarters, (2), SM, O, 1536
 **Chenopodium ambrosioides* L., Mexican tea, (4), DU/SM, C,
1670
Iresine rhizomatosa Standl., Rootstock bloodleaf, (3), SH, C,
1737

Sarcocornia perennis (Mill.) A.J. Scott, Perennial glasswort, (4),
DU/SM, C, 1525 [= *Salicornia perennis* Mill.: The segregation
of the perennial from the annual species of *Salicornia* may
render *Sarcocornia* paraphyletic (Kandereit et al. 2006),
and *Salicornia* s.l. (including both perennial and annual
species) is likely monophyletic on the basis of the truncate
perianth apices, pubescent nonperispermous seeds, and
membranous testa (Judd & Ferguson 1999).]
Suaeda linearis (Elliott) Moq., Sea blite, (2), SM, O, 1537

Amaryllidaceae

**Crinum asiaticum* L., Poisonbulb, (4), CULT, 1672

Anacardiaceae

Rhus copallina L., Winged sumac, (1)/(5), DA/PF/SA/SW, C-O,
1636, 1695
Toxicodendron radicans (L.) Kuntze, Eastern poison ivy, (3),
DA/MH/SW, C, 1726

Annonaceae

Asimina incana (W. Bartram) Exell, Woolly pawpaw, (5), SA,
O, 1203
Asimina parviflora (Michx.) Dunal, Smallflower pawpaw, (3),
MH, O, 1390
Asimina pygmea (W. Bartram) Dunal, Dwarf pawpaw, (1),
AQ/DA, C, 1325

Apiaceae

Centella asiatica (L.) Urb., Spadeleaf, (3), DA, C, 1419
Cicuta maculata L., Spotted water hemlock, (1), AQ/DA, r,
1713
 **Cyclospermum leptophyllum* (Pers.) Sprague ex Britton & P.
Wilson, Marsh parsley, (1), DA/SW, I, 1307
Eryngium aromaticum Baldwin, Fragrant eryngo, (3), SA, O,
1732
Eryngium baldwinii Spreng., Baldwin's eryngo, (5), DA/SA, O,
1469
Oxypolis filiformis (Walter) Britton subsp. *filiformis*, Water
cowbane, (1), AQ/PF, r, 1682
Sanicula canadensis L., Canadian blacksnakeroot, (3), MH, C,
1472
Spermolepis divaricata (Walter) Raf., Roughfruit scaleseed,
(3), DA, C, 1266

Apocynaceae

Asclepias tomentosa Elliott, Velvetleaf milkweed, (3), DA/MH,
r, 1560 [UNI]
Cynanchum angustifolium Pers., Gulf coast swallowwort, (2),
SM, O, 1540
Cynanchum scoparium Nutt., Leafless swallowwort, (3), SH,
C, 1738

Aquifoliaceae

Ilex ambigua (Michx.) Torr. var. *ambigua*, Carolina holly, (3),
MH, O, 1293
Ilex cassine L. var. *cassine*, Dahoon, (5), SA/SW, r, 1634
Ilex cassine L. var. *myrtifolia* (Walter) Sarg., Myrtle dahoon, (1),
DA/PF, O, 1352
Ilex glabra (L.) A. Gray, Inkberry, (1)/(3), AQ/DA/MH/PF, O, 1294,
1328, 1366
Ilex opaca Aiton var. *opaca*, American holly, (1), DA/PF, O-r,
1331, 1353

Ilex vomitoria Aiton, Yaupon, (1), AQ/DA, c, 1357

Araceae

**Landoltia punctata* (G. Mey.) Les & D. J. Crawford, Dotted duckweed, (1), AQ/DA, c, 1382

Lemna aequinoctialis Welw., Lesser duckweed, (5), AQ, c, 1209

Araliaceae

Aralia spinosa L., Devil's walkingstick, (3), MH, c, 1586

**Hedera helix* L., English ivy, (3), CULT, 1269

Hydrocotyle bonariensis Comm. ex Lam., Largeleaf marshpen-nywort, (3), DA/DU, c, 1481

Hydrocotyle umbellata L., Manyflower marshpennywort, (3), DA, o, 1261

Arecaceae

Sabal palmetto (Walter) Lodd. ex Schult. & Schult. f., Cabbage palm, (3), MH, c, 1439

Serenoa repens (W. Bartram) Small, Saw palmetto, (3), MH, c, 1438

Aristolochiaceae

Aristolochia serpentaria L., Virginia snakeroot, (3), MH, r, 1565
[UNI]

Asparagaceae

**Asparagus aethiopicus* L., Sprenger's asparagus-fern, (4), [CAT], CULT, 1374

Asteraceae

Ambrosia artemisiifolia L., Common ragweed, (2), DA/SM, c, 1539

Baccharis halimifolia L., Groundsel tree, (3), SM, c, 1600

Balduina angustifolia (Pursh) B.L. Rob., Coastalplain honeycombhead, (3), SA, r, 1733

Balduina uniflora Nutt., Oneflower honeycombhead, (1), PF, o, 1688

Berlandiera pumila (Michx.) Nutt., Soft greeneyes, (3), SA, c, 1298

Bidens alba (L.) DC., Beggarticks, (3), DA/MH, o, 1246

Bidens bipinnata L., Spanish needles, (3), MH, c, 1578

Bidens mitis (Michx.) Sherff, Smallfruit beggarticks, (1), DA/PF, c, 1701

Bigelowia nudata (Michx.) DC. subsp. *nudata*, Pineland rayless goldenrod, (1), PF, c, 1687

Borrichia frutescens (L.) DC., Bushy seaside oxeye, (3), DU/DA, c, 1478

Carphephorus corymbosus (Nutt.) Torr. & A. Gray, Coastalplain chaffhead, (3), SA, c, 1734

Carphephorus odoratissimus (J.F. Gmel.) H. Herbert var. *odoratissimus*, Vanillaleaf, (1), DA/PF, o, 1696

Cirsium horridulum Michx., Purple thistle, (1), AQ/DA, o, 1370

Cirsium nuttallii DC., Nuttall's thistle, (1), DA/sw, o, 1498

Conoclinium coelestinum (L.) DC., Blue mistflower, (3), DA/MH, o, 1480

Conyza canadensis (L.) Cronquist var. *canadensis*, Canadian horseweed, (3), MH, i, 1577

**Coreopsis basalis* (A. Dietr.) S. F. Blake, Goldenmane tickseed, (3), DA, r, 1277 [UNI]

Eclipta prostrata (L.) L., False daisy, (3), AQ/MH/sw, i, 1431

Elephantopus elatus Bertol., Tall elephantsfoot, (5), SA, c, 1655

Elephantopus nudatus A. Gray, Smooth elephantsfoot, (3)/(5), MH/SA, c, 1579, 1609

Erechtites hieraciifolius (L.) Raf. ex DC., Fireweed, (5), AQ, i, 1447

Erigeron quercifolius Poir., Oakleaf fleabane, (3), DA/MH, c, 1218

Erigeron vernus (L.) Torr. & A. Gray, Early whitetop fleabane, (1), DA/PF, r, 1706

Eupatorium album L., White thoroughwort, (3), SA, r, 1731
[UNI]

Eupatorium capillifolium (Lam.) Small ex Porter & Britton, Dogfennel, (5), SA, o, 1615

Eupatorium leptophyllum DC., Falsefennel, (5), SA, o, 1624

Eupatorium mohrii Greene, Mohr's thoroughwort, (1), DA/PF, o, 1515

Eupatorium rotundifolium L., Roundleaf thoroughwort, (5), SA/sw, o, 1465, 1466

Euthamia caroliniana (L.) Greene ex Porter & Britton, Slender flattop goldenrod, (1), DA/PF, c, 1691

Gaillardia pulchella Foug., Firewheel, (3), DA/CULT?, c, 1477 [Likely planted with associated *Lantana* spp. near dock.]

Gamochaeta antillana (Urban) Anderberg, Caribbean purple everlasting, (3), DA, c, 1241 [*Gamochaeta falcata* (Lam.) Cabrera, misapplied, as listed in Wunderlin and Hansen (2003); see Nesom (2006a) and Wunderlin and Hansen (2007).]

Gamochaeta pensylvanica (Willd.) Cabrera, Pennsylvania everlasting, (3), DA/MH, o, 1237

Helianthus angustifolius L., Narrowleaf sunflower, (1), DA/PF, c, 1694

Heterotheca subaxillaris (Lam.) Britton & Rusby, Camphorweed, (4), DA, c, 1674

**Hypochaeris brasiliensis* (Less.) Hook. & Arn. var. *tweedii* (Hook. & Arn.) Baker, Tweed's catsear, (3), DA, i, 1415

Iva frutescens L., Bigleaf sumpweed, (3), SM, c, 1599

Iva microcephala Nutt., Piedmont marshelder, (5), AQ, o, 1649

Krigia virginica (L.) Willd., Virginia dwarfdandelion, (1), DA, o, 1329

Liatris elegantula (Greene) K. Schum., Grassleaf gayfeather, (1), DA/PF, c, 1702 [= *Liatris graminifolia* Willd. var. *elegantula* (Greene) Gaiser as listed in Wunderlin and Hansen (2003); see Nesom (2006b) and Wunderlin and Hansen (2007).]

Liatris spicata (L.) Willd., Dense gayfeather, (1), PF, c, 1685

Liatris tenuifolia Nutt. var. *quadriflora* Chapm., Shortleaf gayfeather, (5), SA, c, 1605 [Listed in Wunderlin and Hansen (2003) as endemic to Florida, but this variety has been recently vouchered from Cumberland Island, Georgia (Zomlefer et al., in prep.).]

Liatris tenuifolia Nutt. var. *tenuifolia*, Shortleaf gayfeather, (3), SA, c, 1735

Lygodesmia aphylla (Nutt.) DC., Rose-rush, (3), SA, r, 1300

Melanthera nivea (L.) Small, Snow squarestem, (3), MH, c, 1476

Mikania scandens (L.) Willd., Climbing hempvine, (3), MH, c, 1717

Palafoxia integrifolia (Nutt.) Torr. & A. Gray, Coastalplain palafox, (3), SA, i, 1729

Pityopsis graminifolia (Michx.) Nutt., Narrowleaf silkgrass, (3)/(5), SA, c, 1607, 1736

Pluchea foetida (L.) DC., Stinking camphorweed, (1), DA/PF, i, 1693
Pluchea rosea R. K. Godfrey, Rosy camphorweed, (5), AQ/SA/sw, o-i, 1443, 1467
Pterocaulon pycnostachyum (Michx.) Elliott, Blackroot, (5), SA/sw, o, 1461
Pyrrhopappus carolinianus (Walter) DC., Carolina desertchicory, (3), DA, o, 1221
Sericocarpus tortifolius (Michx.) Nees, Whitetop aster, (3), SA, i, 1730
Smallanthus uvedalia (L.) Mack. ex Small, Hairy leafcup, (2), DA/MH, c, 1534
Solidago fistulosa Mill., Pinebarren goldenrod, (1), DA/PF, c, 1692
Solidago odora Aiton var. *chapmanii* (A. Gray) Cronquist, Chapman's goldenrod, (3), MH, o, 1576
Solidago sempervirens L., Seaside goldenrod, (2), SM, o, 1657
**Sonchus asper* (L.) Hill, Spiny sowthistle, (3), DA, i, 1414
**Sonchus oleraceus* L., Common sowthistle, (3), DA/MH, o, 1239
Symphyotrichum carolinianum (Walter) Wunderlin & B. F. Hansen, Climbing aster, (1), AQ/DA, r, 1715
Symphyotrichum tenuifolium (L.) G. L. Nesom, Perennial salt-marsh aster, (1), AQ/DA, r, 1711
**Taraxacum officinale* Weber ex F. H. Wigg., Common dandelion, (3), DA/MH, o, 1288
Verbesina virginica L., Frostweed, (2)/(4), DU/MH, o-r, 1664 [UNI], 1671
Vernonia gigantea (Walter) Trel. ex Branner & Coville, Giant ironweed, (3), DA/MH, i, 1393
**Youngia japonica* (L.) DC., Oriental false hawksbeard, (3), DA/MH, c, 1236

Bataceae

Batis maritima L., Saltwort, (4), DU/SM, c, 1524

Betulaceae

Carpinus caroliniana Walter, American hornbeam, (1), sw, c, 1337, 1489

Bignoniaceae

Bignonia capreolata L., Crossvine, (3), DA/MH, i, 1285
Campsis radicans (L.) Seemann, Trumpet creeper, (3), DA, o, 1424
**Macfadyena unguis-cati* (L.) A. H. Gentry, Catclawvine, (4), [CAT I], DA, o, 1373

Brassicaceae

**Cardamine hirsuta* L., Hairy bittercress, (3), AQ/MH/sw, o, 1290
Descurainia pinnata (Walter) Britton, Western tansymustard, (3), DA, c, 1265
Lepidium virginicum L., Virginia pepperweed, (3), DA, i, 1231

Bromeliaceae

Tillandsia recurvata (L.) L., Ballmoss, (3), DA/MH, c, 1252
Tillandsia usneoides (L.) L., Spanish moss, (1), DA/PF, c, 1354

Cactaceae

Opuntia pusilla (Haw.) Haw., Cockspur pricklypear, (3), SH, c, 1385
Opuntia stricta (Haw.) Haw., Erect pricklypear, (2), SM, o, 1549

Campanulaceae

Lobelia glandulosa Walter, Glade lobelia, (1), AQ/PF, r, 1683
Triodanis perfoliata (L.) Nieuwl., Clasping Venus'lookingglass, (3), DA, c, 1264
**Wahlenbergia marginata* (Thunb.) A. DC., Southern rockbell, (1), DA, c, 1330

Cannabaceae

Celtis laevigata Willd., Hackberry, (4), DU, i, 1526

Caprifoliaceae

**Lonicera japonica* Thunb., Japanese honeysuckle, (4), [CAT I], CULT, 1377

Lonicera sempervirens L., Coral honeysuckle, (3), DA, o, 1272

Caryophyllaceae

**Cerastium glomeratum* Thuill., Mouse-ear chickweed, (3), DA, c, 1214

Silene antirrhina L., Sleepy catchfly, (3), DA, i, 1276

Spergularia marina (L.) Griseb., Salt sandspurry, (4), DA, c, 1378

**Stellaria media* (L.) Vill., Common chickweed, (3), DA, c, 1213

Celastraceae

Euonymus americanus L., American strawberrybush, (3), MH, c, 1582

Chrysobalanaceae

Licania michauxii Prance, Gopher apple, (3), SA, c, 1550

Cistaceae

Lechea torreyi (Chapm.) Legg. ex Britton, Piedmont pinweed, (5), SA, c, 1623

Commelinaceae

Callisia graminea (Small) G. C. Tucker, Grassleaf roseling, (3), SA, o, 1551

**Commelina caroliniana* Walter, Carolina dayflower, (3), AQ/MH/sw, o, 1289

Commelina erecta L., Whitemouth dayflower, (3), DA, c, 1401

**Gibasis pellucida* (M. Martens & Galeotti) D. R. Hunt, Tahitian bridalveil, (4), DA, o, 1372 [Escaped from cultivation; may be locally naturalized.]

Tradescantia ohiensis Raf., Bluejacket, (3), DA, o, 1271

Convolvulaceae

Dichondra carolinensis Michx., Carolina ponyfoot, (3), DA, o, 1256

Ipomoea alba L., Moonflower, (3), DA/DU, o, 1593

Ipomoea cordatotriloba Dennst., Tievine, (3), MH, o, 1580

Ipomoea pandurata (L.) G. Mey., Man-of-the-earth, (2), DA/MH, o, 1535

Ipomoea sagittata Poir., Saltmarsh morning-glory, (1), AQ/DA, r, 1518

Stylisma patens (Desr.) Myint, Coastalplain dawnflower, (3), SA, o, 1556

Cornaceae

Nyssa sylvatica Marshall var. *biflora* (Walter) Sarg., Swamp tupelo, (1), AQ/DA/sw, c-o, 1338, 1356, 1367

Cucurbitaceae

Melothria pendula L., Creeping cucumber, (2)/(3), DA/MH, o-r, 1661 [UNI], 1720

Cyperaceae

Carex albicans Willd. ex Spreng. var. *australis* (L. H. Bailey) Rettig, Whitetinge sedge, (3), DA, r, 1413

Carex atlantica L. H. Bailey subsp. *capillacea* (L. H. Bailey) Reznicek, Prickly bog sedge, (1), sw, i, 1311

Carex glaucescens Elliott, Clustered sedge, (1), AQ/DA/PF, o, 1516

Carex striata Michx., Walter's sedge, (1), DA/PF, o, 1351

Carex vulpinoidea Michx., Fox sedge, (1), DA/sw, o, 1318

Cladium jamaicense Crantz, Jamaica swamp sawgrass, (1), AQ/DA, c, 1544

Cyperus croceus Vahl, Baldwin's flatsedge, (3), DA, o-i, 1395, 1403

**Cyperus esculentus* L., Yellow nutgrass, (3), AQ/MH/sw, o, 1434

Cyperus odoratus L., Fragrant flatsedge, (3), MH, o, 1585

Cyperus retrorsus Chapm., Pinebarren flatsedge, (5), SA/sw, o, 1614, 1620

Eleocharis baldwinii (Torr.) Chapm., Baldwin's spikerush, (1), DA/PF, i, 1704 [UNI]

Eleocharis flavescens (Poir.) Urb., Yellow spikerush, (1), AQ/DA, o, 1368

Eleocharis vivipara Link, Viviparous spikerush, (5), AQ, i, 1653

Fimbristylis autumnalis (L.) Roem. & Schult., Slender fimbry, (5), SA/sw, o, 1618

Fuirena breviseta (Coville) Coville, Saltmarsh umbrellasedge, (1), AQ/PF, c, 1684

Fuirena scirpoidea Michx., Southern umbrellasedge, (5), AQ/SA, o-i, 1200, 1204

Rhynchospora caduca Elliott, Anglestem beaksedge, (1), AQ/sw, o, 1547

Rhynchospora colorata (L.) H. Pfeiff., Starrush whitetop, (1), AQ/DA, o, 1360

Rhynchospora fascicularis (Michx.) Vahl, Fascicled beaksedge, (1)/(3)/(5), AQ/DA/MH/PF/sw, c-o, 1355, 1435, 1444, 1512, 1546

Rhynchospora inundata (Oakes) Fernald, Narrowfruit horned beaksedge, (1)/(5), AQ/sw, c-o, 1548, 1647

Rhynchospora megalocarpa A. Gray, Sandyfield beaksedge, (5), SA/sw, i, 1459

Rhynchospora microcephala (Britton) Britton ex Small, Bunched beaksedge, (1), sw, i, 1545

Rhynchospora plumosa Elliott, Plumed beaksedge, (1)/(3), DA/PF/SA, i, 1297, 1326

Scleria ciliata Michx. var. *ciliata*, Fringed nutrush, (1)/(5), DA/PF/SA, r, 1191, 1384

Scleria oligantha Michx., Littlehead nutrush, (1), DA, c, 1324

Scleria reticularis Michx., Netted nutrush, (5), AQ, o, 1441

Dioscoreaceae

**Dioscorea bulbifera* L., Air-potato, (3), [CAT i], DA, c, 1426

Droseraceae

Drosera intermedia Hayne, Water sundew, (5), AQ, o, 1207

Ebenaceae

Diospyros virginiana L., Common persimmon, (5), AQ, o, 1440

Ericaceae

Bejaria racemosa Vent., Tarflower, (1), DA/PF, o, 1345

Ceratiola ericoides Michx., Florida rosemary, (3), SA, o, 1727

Gaylussacia dumosa (J. Kenn.) Torr. & A. Gray, Dwarf huckleberry, (5), SA, i, 1190

Gaylussacia nana (A. Gray) Small, Glaucous huckleberry, (5), SA, o, 1198 [= *Gaylussacia frondosa* (L.) Torr. & A. Gray ex Torr. var. *tomentosa* A. Gray, as listed in Wunderlin and Hansen (2003). *Gaylussacia nana* is distinct from *G. tomentosa* and from the more northern, *G. frondosa*: *Gaylussacia nana* and *G. tomentosa* are sympatric, morphologically diagnosable, and differ in chromosome number. *Gaylussacia frondosa* is also morphologically distinct and occurs disjunctly in Florida only in Santa Rosa County; see Duncan & Brittain (1966) and Luteyn et al. (1996).]

Gaylussacia tomentosa (A. Gray) Small, Southern huckleberry, (5), SA, o, 1201 [= *Gaylussacia frondosa* (L.) Torr. & A. Gray ex Torr. var. *tomentosa* A. Gray, as listed in Wunderlin and Hansen (2003). See annotation above under *G. nana*.]

Kalmia hirsuta Walter, Hairy laurel, (5), SA, o, 1449

Lyonia ferruginea (Walter) Nutt., Rusty staggerbush, (5), SA, c, 1196

Lyonia fruticosa (Michx.) G. S. Torr., Coastalplain staggerbush, (1), AQ/DA, c, 1323

Lyonia mariana (L.) D. Don, Piedmont staggerbush, (3)/(5), AQ/MH/SA, i, 1287, 1650

Lyonia lucida (Lam.) K. Koch, Fetterbush, (5), SA, c, 1197

Rhododendron canescens (Michx.) Sweet, Mountain azalea, (1), DA/PF, o, 1212

**Rhododendron simsii* Planch., Formosa azalea, (3), CULT, 1302

Vaccinium arboreum Marshall, Sparkleberry, (3), DA/MH, o, 1286

Vaccinium corymbosum L., Highbush blueberry, (1)/(3), AQ/DA/MH/PF, c-i, 1210, 1234, 1321

Vaccinium myrsinites Lam., Shiny blueberry, (5), SA, c, 1189

Vaccinium stamineum L., Deerberry, (3), MH, o, 1292

Eriocaulaceae

Eriocaulon decangulare L., Tenangle pipewort, (1), DA/PF, c, 1514

Lachnocaulon anceps (Walter) Morong, Whitehead bogbutton, (1), AQ/DA/PF, o-r, 1343, 1507

Euphorbiaceae

Acalypha gracilens A. Gray, Slender threeseed mercury, (3), DA, o, 1420

Chamaesyce hirta (L.) Millsp., Pillpod sandmat, (3), DA, o, 1402

Chamaesyce hyssopifolia (L.) Small, Hyssopleaf sandmat, (3), DA, c-o, 1409, 1482, 1595

Chamaesyce maculata (L.) Small, Spotted sandmat, (3), DA, r, 1262 [UNI]

Cnidoscolus stimulosus (Michx.) Engelm. & A. Gray, Tread softly, (3), SA, o, 1299

Croton glandulosus L. var. *glandulosus*, Vente conmigo, (3), DA, o, 1408

Poinsettia cyathophora (Murray) Bartl., Paintedleaf, (3), DA/MH, i, 1238

Poinsettia heterophylla (L.) Klotzsch & Garcke ex Klotzsch, Fiddler's spurge, (3), DA, o, 1417

**Sapium sebiferum* (L.) Roxb., Popcorn tree, (1), [CAT i], AQ/DA, o, 1365

Stillingia sylvatica L., Queensdelight, (3), SA, i, 1552
Tragia urens L., Wavyleaf noseburn, (3), MH, o, 1564

Fabaceae

Amorpha fruticosa L., Bastard false indigobush, (1), AQ/DA, i, 1521
Amphicarpa bracteata (L.) Fernald, American hogpeanut, (3), MH, o, 1588
Centrosema virginianum (L.) Benth., Spurred butterfly pea, (4), DA, o, 1531
Cercis canadensis L., Eastern redbud, (3), CULT, 1563
Chamaecrista fasciculata (Michx.) Greene, Partridge pea, (4), DA, o, 1667
Chamaecrista nictitans (L.) Moench var. *aspera* (Muhl. ex Elliott) H. S. Irwin & Barneby, Sensitive pea, (5), SA/SW, o, 1608
Chamaecrista nictitans (L.) Moench var. *nictitans*, Sensitive pea, (1), DA/SW, c, 1708
Crotalaria rotundifolia J.F. Gmel., Rabbitbells, (3), SA, o, 1301
Desmodium glabellum (Michx.) DC., Dillenius' ticktrefoil, (3), MH, o, 1591
**Desmodium incanum* DC., Zarzabacoa comun, (3), DA, c, 1400
Desmodium paniculatum (L.) DC., Paniced ticktrefoil, (2), DA/SM, o, 1656
Erythrina herbacea L., Coralbean, (3), SA, c, 1559
Galactia ellottii Nutt., Elliott's milkpea, (3), DA/MH, c, 1423
Galactia volubilis (L.) Britton, Downy milkpea, (3), SH, o, 1569
**Indigofera hirsuta* L., Hairy indigo, (1), DA/PF, o, 1698
**Indigofera tinctoria* L., True indigo, (4), CULT, 1676
Lupinus diffusus Nutt., Skyblue lupine, (5), SA, r, 1612
**Medicago lupulina* L., Black medick, (3), DA, o, 1250
**Melilotus indicus* (L.) All., Indian sweetclover, (3), DA, o, 1220
Sesbania vesicaria (Jacq.) Elliott, Bladderpod, (1), SW, o, 1689
Strophostyles helvola (L.) Elliott, Trailing fuzzybean, (3), DA/DU, c, 1479
**Trifolium repens* L., White clover, (3), DA, c, 1217
**Wisteria sinensis* (Sims) Sweet, Chinese wisteria, (4), [CAT II], DA, c, 1528

Fagaceae

Quercus chapmanii Sarg., Chapman's oak, (5), SA, o, 1616
Quercus ellottii Wilbur, Running oak, (1), DA/PF, o, 1327
Quercus geminata Small, Sand live oak, (5), SA, c, 1199
Quercus hemisphaerica Bartr. ex Willd., Darlington oak, (4), DA/MH, i, 1666 [Included as a synonym of *Q. laurifolia* Michx. in Wunderlin and Hansen (2003); see Jensen (1997), who treats these as two species. In our area they are reproduc-tively isolated by ecology and phenology.]
Quercus laevis Walter, Turkey oak, (3), SA, c, 1736b
Quercus laurifolia Michx., Laurel oak, (1)/(5), DA/PF/SW, o, 1347, 1631 [Considered here as *Q. laurifolia* s.s. sensu Jensen (1997); see annotation under *Q. hemisphaerica* above.]
Quercus minima (Sarg.) Small, Dwarf live oak, (1), DA/PF, o, 1383
Quercus myrtifolia Willd., Myrtle oak, (1), DA/PF, i, 1348
Quercus nigra L., Water oak, (1), DA/PF, c, 1500
Quercus virginiana Mill., Live oak, (1), AQ/DA, o, 1363

Gelsemiaceae

Gelsemium sempervirens (L.) W.T. Aiton, Yellow jessamine, (5), SA/sw, o, 1635

Gentianaceae

Sabatia brevifolia Raf., Shortleaf rosegentian, (1), DA/PF, o, 1707

Sabatia stellaris Pursh, Rose-of-plymouth, (5), DA/SA, o, 1470

Geraniaceae

Geranium carolinianum L., Carolina cranesbill, (3), DA, c, 1249

Haemodoraceae

Lachnanthes caroliana (Lam.) Dandy, Carolina redroot, (1), AQ/DA/PF, c, 1509

Haloragaceae

Proserpinaca pectinata Lam., Combleaf mermaidweed, (1), AQ/DA/PF, c, 1349

Hamamelidaceae

Hamamelis virginiana L., American witchhazel, (3), MH, c, 1232

Hydrocharitaceae

Limnobium spongia (Bosc) Rich. ex Steud., Frog's-bit, (3), AQ, i, 1284

Hypericaceae

Hypericum brachyphyllum (Spach) Steud., Coastalplain St. John's-wort, (1), DA/PF, c, 1508

Hypericum cistifolium Lam., Roundpod St. John's-wort, (5), AQ/SA/SW, o, 1456

Hypericum fasciculatum Lam., Peelbark St. John's-wort, (1), AQ/DA/PF, o, 1211

Hypericum gentianoides (L.) Britton et al., Pineweeds, (1), DA/PF, c, 1505

Hypericum hypericoides (L.) Crantz, St. Andrew's-cross, (1)/(3), DA/PF/SA/SW, o-i, 1317, 1346, 1728

Hypericum mutilum L., Dwarf St. John's-wort, (1), DA/PF, o, 1503

Hypericum myrtifolium Lam., Myrtleleaf St. John's-wort, (5), AQ, c, 1445

Hypericum reductum (Svenson) W. P. Adams, Atlantic St. John's-wort, (5), SA, c, 1450

Hypericum tetrapetalum Lam., Fourpetal St. John's-wort, (1)/(5), DA/PF/SA, o-r, 1192, 1193, 1339

Triadenum virginicum (L.) Raf., Virginia marsh St. John's-wort, (5), AQ/sw, i, 1627

Hypoxidaceae

Hypoxis curtissii Rose, Common yellow stargrass, (1), sw, o, 1312

Illiciaceae

Illicium parviflorum Michx. ex Vent., Star anise, (3), CULT, 1561

Iridaceae

Iris hexagona Walter, Dixie iris, (1), sw, c, 1304

Sisyrinchium angustifolium Mill., Narrowleaf blue-eyed grass, (3), DA, o, 1247

Sisyrinchium atlanticum E. P. Bicknell, Eastern blue-eyed grass, (1), DA/sw, c, 1306 [Included as a synonym of *S. angustifolium* s.l. in Wunderlin and Hansen (2003); see Cholewa and

Henderson (2002) who treat these as two species based on stem width and foliage color.]

**Sisyrinchium rosulatum* E. P. Bicknell, Annual blue-eyed grass, (3), DA, i, 1223

Juglandaceae

Carya glabra (Mill.) Sweet, Pignut hickory, (3), DA/MH, o, 1398

Juncaceae

Juncus acuminatus Michx., Tapertip rush, (5), AQ/SA/sw, o, 1460

Juncus coriaceus Mack., Leathery rush, (1), DA/sw, c, 1496

Juncus dichotomus Elliott, Forked rush, (1), DA/sw, c, 1319

Juncus effusus L. subsp. *solutus* (Fernald & Wiegand) Hämet-Ahti, Soft rush, (1), AQ/DA/PF, c, 1334, 1344

Juncus elliottii Chapm., Bog rush, (1), AQ/DA/PF, c-o, 1332, 1358

Juncus marginatus Rostk., Shore rush, (5), AQ/SA/sw, i, 1464

Juncus megacephalus M. A. Curtis, Bighead rush, (1), AQ/DA, i, 1359

Juncus polycephalus Michx., Manyhead rush, (5), AQ, c, 1446

Juncus roemerianus Scheele, Black rush, (3), SM, c, 1571

Juncus scirpoides Lam., Needlepod rush, (5), AQ/sw, o, 1625

Lamiaceae

Callicarpa americana L., American beautyberry, (3), DA/MH, c, 1394

**Hyptis mutabilis* (Rich.) Briq., Tropical bushmint, (3), DA, c, 1594

Lycopus rubellus Moench, Taperleaf Waterhorehound, (1), AQ/sw, o, 1690

Monarda punctata L., Spotted beebealm, (4), DA, o, 1675

Piloblephis rigida (W. Bartram ex Benth.) Raf., Wild pennyroyal, (5), SA, r, 1194

Salvia lyrata L., Lyreleaf sage, (3), DA/MH, c, 1245

Scutellaria integrifolia L., Helmet skullcap, (1), AQ/DA, o, 1517

Stachys floridana Shuttlew. ex Benth., Florida hedgenettle, (3), DA/MH, o, 1215

Trichostema dichotomum L., Forked bluecurls, (1), PF, o, 1681

Lauraceae

**Cinnamomum camphora* (L.) J. Presl, Camphortree, (1), [CAT], sw, i, 1493

**Persea americana* Mill., Avocado, (4), CULT, 1530

Persea borbonia (L.) Spreng. var. *borbonia*, Red bay, (2)/(3), MH, c, 1662, 1723

Persea palustris (Raf.) Sarg., Swamp bay, (1), AQ/DA, i, 1320

Lentibulariaceae

Utricularia subulata L., Zigzag bladderwort, (1), DA/PF, o, 1336

Linaceae

Linum medium (Planch.) Britton var. *texanum* (Planch.) Fernald, Stiff yellow flax, (1), DA/PF, c, 1502, 1504

Lythraceae

**Lagerstroemia indica* L., Crapemyrtle, (3), CULT, 1573

Magnoliaceae

Magnolia grandiflora L., Southern magnolia, (3), MH, o, 1581

Magnolia virginiana L., Sweetbay, (5), sw, i, 1638

Malvaceae

**Gossypium barbadense* L., Sea island cotton, (4), CULT, 1677

Kosteletzkyva virginica (L.) C. Presl ex A. Gray, Virginia saltmarsh mallow, (1), AQ/DA, r, 1712

**Malvaviscus arboreus* Cav. var. *drummondii* (Torr. & A. Gray) Schery, Texas waxmallow, (4), CULT, 1527

Sida acuta Burm. f., Common wireweed, (4), DU, o, 1680

Sida rhombifolia L., Cuban jute, (1)/(3), DA, c-o, 1427, 1495

Melastomataceae

Rhexia alifanus Walter, Savannah meadowbeauty, (1), AQ/DA/PF, o, 1510

Rhexia mariana L., Pale meadowbeauty, (5), SA/sw, i, 1453

Rhexia petiolata Walter, Fringed meadowbeauty, (5), SA/sw, o, 1622

Menispermaceae

Cocculus carolinus (L.) DC., Carolina coralbead, (2), DA/MH, c, 1533

Moraceae

**Fatoua villosa* (Thunb.) Nakai, Hairy crabweed, (3), MH, o, 1589

**Ficus pumila* L., Climbing fig, (3), CULT, 1273

Morus rubra L., Red mulberry, (3), DA/MH, o, 1255

Myricaceae

Myrica cerifera L., Wax myrtle, (5), SA, c, 1195

Nyctaginaceae

Boerhavia diffusa L., Red spiderling, (3), DA, o, 1405

Nymphaeaceae

Nymphaea odorata Sol., American white waterlily, (5), AQ, i, 1651

Oleaceae

Forestiera segregata (Jacq.) Krug & Urb., Florida swampprivet, (3), SH, c, 1570

Fraxinus caroliniana Mill., Water ash, (1), sw, o, 1491

**Ligustrum japonicum* Thunb., Japanese privet, (4), CULT, 1523

Osmanthus americanus (L.) Benth. & Hook. f. ex A. Gray, Wild olive, (3), SA, i, 1557

Onagraceae

Gaura angustifolia Michx., Southern beeblissom, (5), DA/SA, c, 1468

Ludwigia linearis Walter, Narrowleaf primrosewillow, (1), DA/PF, o, 1700

Ludwigia linifolia Poir., Southeastern primrosewillow, (1), DA/DA/PF, c, 1511

Ludwigia maritima R. M. Harper, Seaside primrosewillow, (5), SA/sw, o, 1454

Ludwigia microcarpa Michx., Smallfruit primrosewillow, (5), AQ/DA, o, 1646

**Ludwigia peruviana* (L.) H. Hara, Peruvian primrosewillow, (3), AQ/MH/sw, o, 1718

Ludwigia pilosa Walter, Hairy primrosewillow, (1), DA/PF, c, 1699

Ludwigia sphaerocarpa Elliott, Globefruit primrosewillow, (5), AQ/sw, o, 1628

Ludwigia suffruticosa Walter, Shrubby primrosewillow, (5), AQ, c, 1648

Oenothera laciniata Hill, Cutleaf eveningprimrose, (3)/(5), DA/DU/SA, o, 1186, 1222, 1225

Orobanchaceae

Agalinus fasciculata (Elliott) Raf., Beach false foxglove, (5), SA/sw, o, 1637

Agalinus setacea (J.F. Gmel.) Raf., Threadleaf false foxglove, (5), SA, i, 1610

Seymeria pectinata Pursh, Piedmont blacksenna, (5), SA, o, 1606, 1626

Oxalidaceae

Oxalis corniculata L., Common yellow woodsorrel, (3), DA, i, 1228

**Oxalis debilis* Kunth, Pink woodsorrel, (3), DA, c, 1248

Passifloraceae

Passiflora incarnata L., Purple passionflower, (3), DA, i, 1430

Passiflora lutea L., Yellow passionflower, (3), MH, i, 1583

Phyllanthaceae

Phyllanthus abnormis Baill., Drummond's leafflower, (3), DA, c, 1407

**Phyllanthus tenellus* Roxb., Mascarene Island leafflower, (3), DA, c, 1406

**Phyllanthus urinaria* L., Chamber bitter, (3), DA, c, 1418

Phytolaccaceae

Phytolacca americana L. var. *rigida* (Small) Caulkins & Wyatt, American pokeweed, (3), DA, c, 1425 [This distinct geographical race, previously included in the flora by Wunderlin (1998) but not in the recent edition (Wunderlin & Hansen 2003), merits recognition (see Caulkins & Wyatt 1990).]

Plantaginaceae (Veronicaceae)

Bacopa monnieri (L.) Pennell, Herb-of-grace, (3), AQ/MH/sw, o, 1437

Gratiola hispida (Benth. ex Lindl.) Pollard, Rough hedgehyssop, (5), SA/sw, o, 1451

Gratiola pilosa Michx., Shaggy hedgehyssop, (1)/(5), DA/PF/SA/sw, o, 1455, 1506

Gratiola ramosa Walter, Branched hedgehyssop, (5), AQ, c, 1206

Linaria canadensis (L.) Chaz., Canada toadflax, (5), SA, o, 1185

**Lindernia crustacea* (L.) F. Muell., Malaysian false pimpernel, (3), DA, c, 1724

Plantago virginica L., Virginia plantain, (3), DA, c, 1219

Scoparia dulcis L., Sweetbroom, (5), SA, i, 1448

**Veronica arvensis* L., Corn speedwell, (3), DA, c, 1263

Platanaceae

Platanus occidentalis L., American sycamore, (1), sw, o, 1486

Plumbaginaceae

Limonium carolinianum (Walter) Britton, Carolina sealavender, (2), SM, o, 1658

Poaceae

Agrostis hyemalis (Walter) Britton et al., Tickleglass, (1)/(3), AQ/DA, c-o, 1229, 1361

Andropogon glomeratus (Walter) Britton et al. var. *glomeratus*, Bushy bluestem, (5), SA, o, 1645

Andropogon glomeratus (Walter) Britton et al. var. *pumilus* (Vasey) Vasey ex L. H. Dewey, Bushy bluestem, (5), SA, o, 1643

Andropogon virginicus L. var. *glaucus* Hack., Chalky bluestem, (5), SA, c, 1642

Andropogon virginicus L. var. *virginicus*, Broomsedge bluestem, (5), SA, o, 1644

Aristida spiciformis Elliott, Bottlebrush threeawn, (5), SA, c, 1613

Aristida stricta Michx. var. *beyrichiana* (Trin. & Rupr.) D. B. Ward, Wiregrass, (5), SA, o, 1611

**Bromus catharticus* Vahl, Rescuergrass, (1), DA/MH, o, 1310

Cenchrus gracillimus Nash, Slender sandbur, (3), SA, r, 1554

Cenchrus spinifex Cav., Coastal sandspur, (3), DA/DU, c, 1596

Chasmanthium laxum (L.) Yates var. *sessiliflorum* (Poir.) Wipff & S. D. Jones, Longleaf woodoats, (1)/(3), DA/MH/sw, c-i, 1392, 1488

**Dactyloctenium aegyptium* (L.) Willd. ex Asch. & Schweinf., Durban crowfootgrass, (3), DA, c, 1602

Dichanthelium aciculare (Desv. ex Poir.) Gould & C. A. Clark, Needleleaf witchgrass, (1)/(5), DA/PF/SA, c-o, 1187, 1188, 1350

Dichanthelium commutatum (Schult.) Gould, Variable witchgrass, (3), DA/MH, c, 1235

Dichanthelium laxiflorum (Lam.) Gould, Openflower witchgrass, (1), DA/sw, c, 1308

Digitaria ciliaris (Retz.) Koeler, Southern crabgrass, (3), DA, c-i, 1399, 1483

Distichlis spicata (L.) Greene, Saltgrass, (3), SM, c, 1597

**Eleusine indica* (L.) Gaertn., Indian goosegrass, (3), DA, c, 1428

Elymus virginicus L., Virginia wildrye, (3), DA, c, 1412

Eragrostis elliottii S. Watson, Elliott's lovegrass, (5), SA, c, 1617, 1633

**Eremochloa ophiuroides* (Munro) Hack., Centipedegrass, (4), DA, c, 1673

Eustachys petraea (Sw.) Desv., Pinewoods fingergrass, (3), SH, o, 1387

Melica mutica Walter, Twoflower melicgrass, (2)/(3), DA/SM, o-i, 1411, 1541

Opismenus hirtellus (L.) Beauv., Woodsgrass, (3), MH, o, 1587

Panicum anceps Michx., Beaked panicum, (2)/(5), DA/MH/SA/sw, c-o, 1619, 1663

Panicum hemitomon Schult., Maidencane, (1)/(5), AQ/DA/PF//sw, c-o, 1630, 1703

Panicum verrucosum Muhl., Warty panicgrass, (1)/(5), AQ/DA/sw, c-o, 1629, 1632, 1654, 1709

Panicum virgatum L., Switchgrass, (1)/(3), AQ/DA/SM, c-o, 1543, 1603

**Paspalum notatum* Flüggé var. *notatum*, Bahiagrass, (3), DA, o, 1429

**Paspalum notatum* Flüggé var. *saura* Parodi, Bahiagrass, (3), DA, o, 1404

Paspalum setaceum Michx., Thin paspalum, (3), MH, o, 1590

**Paspalum urvillei* Steud., Vaseygrass, (3)/(5), AQ/MH/sw, o, 1436, 1639

Piptochaetium avenaceum (L.) Parodi, Blackseed needlegrass, (3), MH, o, 1389

**Poa annua* L., Annual bluegrass, (3), DA, c, 1216

**Polypogon monspeliensis* (L.) Desf., Rabbitsfootgrass, (1), DA/sw, r, 1315

Setaria parviflora (Poir.) Kerguélen, Yellow bristlegrass, (1), AQ/DA, r, 1522

Sorghastrum secundum (Elliott) Nash, Lopsided Indiangrass, (1), DA/PF, o, 1714

**Sorghum bicolor* (L.) Moench, Grain sorghum, (4), CULT, 1678, 1679 [UNI]

Spartina alterniflora Loisel., Saltmarsh cordgrass, (2), sm, c, 1660

Spartina bakeri Merr., Sand cordgrass, (5), AQ, c, 1202

Spartina patens (Aiton) Muhl., Marshhay cordgrass, (3), sm, o, 1598

Sphenopholis obtusata (Michx.) Scribn., Prairie wedgescale, (1)/(3), DA, o-r, 1230, 1267, 1316

**Sporobolus indicus* (L.) R. Br. var. *indicus*, Smutgrass, (3), MH, o, 1471

Stenotaphrum secundatum (Walter) Kuntze, St. Augustine-grass, (3), DA, o, 1421 [This common lawn grass is listed in Wunderlin and Hansen (2003) as native but our collection likely represents an escape from cultivation. The native plants, characteristic of coastal habitats, are diploid, and the cultivated turf plants are polyploids.]

Tridens flavus (L.) Hitchc. var. *flavus*, Purpletop tridens, (3), MH, r, 1584

**Vulpia myuros* (L.) C. C. Gmel., Rattail fescue, (1), AQ/DA/PF, o, 1513

Polemoniaceae

**Phlox drummondii* Hook, Annual phlox, (3), DA, c, 1275

Polygalaceae

Polygala lutea L., Orange milkwort, (1), DA/PF, c, 1340

Polygala nana (Michx.) DC., Candyroot, (1), DA/PF, o, 1341

Polygonaceae

Polygonum hirsutum Walter, Hairy smartweed, (5), AQ, o, 1442

Polygonum hydropiperoides Michx., Swamp smartweed, (3), AQ/MH/sw, i, 1433

Polygonum punctatum Elliott, Dotted smartweed, (3), AQ/MH/sw, r, 1432 [UNI]

Rumex hastatulus Baldwin, Heartwing dock, (4), DA/DU/sm, r, 1375

Pontederiaceae

**Eichhornia crassipes* (Mart.) Solms, Common water-hyacinth, (3), [CAT I], AQ, c, 1721

Pontederia cordata L., Pickerelweed, (1), sw, o, 1499

Portulacaceae

Portulaca pilosa L., Pink purslane, (3), DA, o, 1601

Rosaceae

Prunus caroliniana Marshall, American plum, (3), DA, o, 1281

Prunus serotina Ehrh. var. *serotina*, Black cherry, (4), DA/MH, o, 1380

**Rosa laevigata* Michx., Cherokee rose, (4), CULT, 1669

Rubus argutus Link, Sawtooth blackberry, (1), DA/PF, c, 1333

Rubus cuneifolius Pursh, Sand blackberry, (1), sw, c, 1305

Rubus trivialis Michx., Southern dewberry, (3), DA, c, 1282

Rubiaceae

Cephaelanthus occidentalis L., Common buttonbush, (3), AQ/DA, o, 1416

Chiococca alba (L.) Hitchc., Snowberry, (3), sh, o, 1568

Diodia teres Walter, Rough buttonweed, (3), DA, o, 1604

Diodia virginiana L., Virginia buttonweed, (1), AQ/DA, o, 1519

Galium hispidulum Michx., Coastal bedstraw, (3), MH/SA, c, 1474, 1553

Galium tinctorium L., Stiff marsh bedstraw, (3), AQ/DA, o, 1283

Houstonia procumbens (J.F. Gmel.) Standl, Roundleaf bluet, (4), DA, o, 1379

Oldenlandia corymbosa L., Flattop mille graine, (4), DA, c, 1668

Oldenlandia uniflora L., Clustered mille graine, (1)/(5), DA/PF/SA/sw, c-o, 1457, 1705

Psychotria nervosa Sw., Wild coffee, (3), MH, c, 1388, 1567

**Richardia brasiliensis* Gomes, Tropical Mexican clover, (3), DA, r, 1257

Ruscaceae

**Aspidistra elatior* Blume, Cast iron plant, (3), MH, r, 1391
[Non-reproductive plants persisting from cultivation; not naturalized.]

**Liriope spicata* Lour., Monkey-grass, (2), DA/MH, r, 1532 [Persisting from cultivation; probably not naturalized.]

Rutaceae

**Citrus ×aurantium* L., Citrus hybrid, (3), DA/MH, r, 1397

**Severinia buxifolia* (Poir.) Ten., Chinese boxorange, (3), CULT?, 1258 [Likely planted and persisting; not naturalized.]

Salicaceae

Salix caroliniana Michx., Carolina willow, (3), AQ/DA, c, 1279

Santalaceae

Phoradendron leucarpum (Raf.) Reveal & M. C. Johnst., Oak mistletoe, (4), DA/MH, o, 1381

Sapindaceae

Acer rubrum L., Red maple, (1), DA/PF, o, 1501

Sapindus saponaria L., Soapberry, (3), MH, c, 1566

Sapotaceae

Sideroxylon tenax L., Tough bully, (3), DA/MH, i, 1396

Sarraceniaceae

Sarracenia minor Walter, Hooded pitcherplant, (1), AQ/DA/PF, r, 1335

Saururaceae

Saururus cernuus L., Lizard's tail, (1), AQ/sw, o, 1314

Smilacaceae

Smilax auriculata Walter, Earleaf greenbrier, (3), SA, c, 1555

Smilax bona-nox L., Saw greenbrier, (3), DA/MH, i, 1254

Smilax glauca Walter, Cat greenbrier, (3), MH, c, 1291

Smilax laurifolia L., Laurel greenbrier, (5), SA/sw, c, 1462

Smilax pumila Walter, Sarsaparilla vine, (3), MH/SA, c-i, 1475, 1558 [UNI]

Smilax tamnoides L., Bristly greenbrier, (2), MH, o, 1665

Solanaceae

Lycium carolinianum Walter, Christmasberry, (2), sm, c-o, 1542, 1659

Physalis walteri Nutt., Walter's groundcherry, (3), DA/DU, c, 1227

Solanum americanum Mill., American black nightshade, (3), DA/MH, i, 1240

Tetrachondraceae

Polypteron procumbens L., Rustweed, (5), SA/SW, o, 1452

Theaceae

Gordonia lasianthus (L.) J. Ellis, Loblolly bay, (1), AQ/DA, o, 1322

Typhaceae

Typha latifolia L., Broadleaf cattail, (1), AQ/PF, i, 1686

Ulmaceae

Ulmus alata Michx., Winged elm, (1), sw, r, 1485

Ulmus americana L., American elm, (1), sw, c, 1309

Urticaceae

Boehmeria cylindrica (L.) Sw., False nettle, (1), sw, c, 1494

Parietaria praetermissa Hinton, Clustered pellitory, (3), DA, r, 1224

Pilea microphylla (L.) Liebm., Artillery plant, (3), DA, c, 1226

Verbenaceae

**Lantana camara* L., Lantana, (3), [CAT I], CULT?, 1244

Lantana depressa Small, Rockland shrubverbena, (3), CULT, 1243

**Lantana montevidensis* (Spreng.) Briq., Trailing shrubverbena, (3), CULT, 1242

Phyla nodiflora (L.) Greene, Turkey tangle fogfruit, (3), DA, o, 1251

**Verbena brasiliensis* Vell., Brazilian vervain, (1), DA/SW, o, 1487

Violaceae

Viola lanceolata L., Bog white violet, (5), AQ, o, 1208

Viola palmata L., Early blue violet, (3), DA, c, 1260

Viola sororia Willd., Common blue violet, (3), DA, o, 1278

Vitaceae

Ampelopsis arborea (L.) Koehne, Peppervine, (3), AQ/DA, o, 1422

Parthenocissus quinquefolia (L.) Planch., Virginia creeper, (3), AQ/DA, o, 1410

Vitis aestivalis Michx., Summer grape, (3), DA/MH, o, 1259

Vitis rotundifolia Michx., Muscadine, (3), DA/MH, c, 1253

Xyridaceae

Xyris ambigua Beyr. ex Kunth, Coastalplain yelloweyed grass, (1), DA/PF, o, 1697

**Xyris jupicai* Rich., Richard's yelloweyed grass, (1), DA/PF, c, 1342

Xyris platylepis Chapm., Tall yelloweyed grass, (5), AQ/SA/SW, o, 1463

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